Avian body weights from southern Ecuador

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This paper presents body weight data for 676 individuals of 169 species. It should be seen as a continuation of King's (1991) presentation of weights of 88 south Ecuadorean species, which to our knowledge is the only previous paper on the subject covering this region. Prior to 1989 the southernmost part of Ecuador was poorly surveyed (Bloch *et al.* 1991), and avian distribution patterns are rather complex, as two centres of endemism (the North Andean and Tumbesian) overlap in the region (Best & Clarke 1991, Bloch *et al.* 1991). In spite of several expeditions to the area in the last couple of years, the area is one of the biogeographically least understood parts of the Andes.

Data and study sites

Data were collected during 6 months (January to July) of fieldwork in 1989 and 3 months (October to January) in 1991–1992. The data from 1989 were collected solely from living mist-netted birds, while some of the data from the second period are from collected specimens. Details of the mist-netting programme in 1989 are given in Bloch *et al.* (1991). Mist-netting was carried out more or less evenly from dawn to dusk. The data have been collected from 14 different localities in the provinces of Loja and Zamora-Chinchipe of southern Ecuador. Localities surveyed (arranged in order of increasing elevation) are as follows:

Upper tropical zone: (1) Rio Bombuscara (04°08′S, 78°58′W), 1000–1300 m. Premontane humid forest. Huge forested area along the Bombuscara River in the Podocarpus National Park connected with the rest of the only remaining cohesive forested area in the Andes region of southern Ecuador. Most of the area is good primary forest with lush undergrowth and tall trees. Some smaller clearings and patches of second growth.

Subtropical zone: (2) New Sabanilla-Zamora road (04°00′S, 79°02′W), 1500–1700 m. Humid montane forest. A patch of primary forest, which is still connected to the forested areas of Podocarpus National Park. A new road is under construction in this area, and the forest is being cut to make way for it, but the area still contains patches of undisturbed forest with dense understory and a moderate cover of epiphytes. (3) Nueva Fatima (04°16′S, 79°49′W), 1750 m. Semi-deciduous montane forest. A very small forest patch (0.2 km^2) of secondary forest, consisting of tall second-growth, dense scrub and a few larger trees. (4) Quebrada Avioneta (04°17′S, 78°56′W), 1900–1950 m. Very wet montane forest. Huge forested area within the forested zone of Podocarpus National Park. Tall primary forest, with an extremely dense cover of epiphytes and some undergrowth; i.e., some scattered cleared areas. (5) East of San Pedro (04°13′S, 79°11′W), 2300 m. Semi-wet montane forest-scrub. A scrubby secondary forest with some understory in a landscape heavily disturbed by settlers. Corridors exist to better forest at higher elevation. (6) Celica I (03°57′S, 79°48′W), 2350–2400 m. Semi-humid montane forest. Rather disturbed primary forest patch strongly influenced by human activity. Less disturbed in upper parts and particularly in ravines, the intervening ridges with much shorter vegetation, in lower parts mainly with secondary growth and with large cleared and burned areas. Undergrowth partly disturbed by cattle.

Temperate zone: (7) Quebrada Honda (04°30′S, 79°07′W), 2400–2500 m. Humid montane forest. Fragmented and disturbed primary forest, with moderate epiphyte cover and undergrowth. Connected to the huge forested area of Podocarpus National Park. (8) Jatumpamba

(04°19′S, 79°52′W), 2500–2600 m. Semi-deciduous montane forest. A small forest patch of mainly secondary forest without any large trees. Understory vegetation very sparse due to grazing by cattle. (9) The farm of David Espinosa (03°58′S, 79°09′W), 2600 m. Humid montane forest. A neighbouring area to Podocarpus National Park with mixed grassland and forest. The forest has a dense undergrowth and moderate cover of epiphytes. The forest edges and the scattered thickets consist solely of secondary growth. (10) Celica II (04°01′S, 79°52′W), 2750 m. Semi-humid montane forest. A small and isolated but rich primary forest patch, with a dense undergrowth. Trees with abundant epiphytes. (11) Selva Alegre (03°32′S, 79°22′W), 2850 m. Wet montane forest. Fragmented primary forest with remarkably tall trees. In the lower parts alternating with pastures, burned areas and thickets with secondary growth. Trees in primary parts with many flowering epiphytes and also thick velvet-like cushions of moss. Undergrowth partly disturbed by cattle grazing inside the forest. Scattered openings due to selective logging. (12) Oña Capa (03°34′S, 79°08′W), 3000 m. Humid montane forest. A few hectares of disturbed primary forest. Moderate cover of epiphytes and many open spaces due to selective felling. Fringes of the forest mixed with thickets of secondary growth. (13) Acanama (03°42′S, 79°13′W), 3000 m. Very wet montane forest. Two patches separated by a ravine with cleared and grazed slopes. Patch 1: mainly secondary growth including a dense undergrowth of *Chusquea* on a small hill; i.e., central parts with tall primary, epiphyte-covered trees. Patch 2: a primary dense forest on a steep slope with reduced undergrowth, instead a mass of tangled, mossy roots in the lowest stratum; the fringe of the forest with dense thickets of *Chusquea*. (14) Cajanuma (04°06′S, 79°09′W, 2700–3200 m. Humid montane forest. Huge forested area in a valley connected to the rest of the only remaining cohesive forested area in the Andes region of southern Ecuador, Podocarpus National Park. In the lowest part (2700–2750 m) mainly secondary growth mixed with some primary forest. From 2750 m primary humid cloud-forest with some large areas with dense undergrowth of *Chusquea*. Conspicuous cover of moss and great abundance of mistletoes and epiphytes. The vegetation grades into a gnarled moss-covered elfin forest at 3000 m.

The weights

All birds were weighed with a Pesola spring balance to the nearest 0.5 g. For any category where at least five weights are available, the mean, standard deviation and range are given. For categories with fewer than five, individual weights are given. Localities where the weights were obtained are indicated by the locality number(s) after the name.

These weights include species that have small geographic ranges (e.g. *Coeligena iris, Thamnophilus zarumae, Ochthoeca jelskii, Basileuterus fraseri, Basileuterus trifasciatus, Atlapetes leucopterus*) and/or are rare and poorly known (e.g. *Pyrrhura albipectus, Galbula pastazae, Grallaricula peruviana, Myiophobus lintoni, Notiochelidon flavipes, Turdus fulviventris*).

The taxonomy of South American birds is at present under extensive revision. Some forms are being elevated from subspecies to species rank, or demoted from species to subspecies rank. Nevertheless, we follow the nomenclature and order of Meyer de Schauensee (1970), even though somewhat outdated, as it still remains the only comprehensive modern treatment of the birds of South America. However, following Traylor (1985) and the recommendation of R. S. Ridgely and P. G. Greenfield (*in litt.*) we have treated the following taxa as distinct species: *Thamnophilus zarumae* is regarded as distinct from *T. doliatus; Myrmotherula spodionota* is regarded as distinct from the lowland species *M. haematonota; Ochthoeca jelskii* is separated as a species from *O. pulchella* of Peru and Bolivia; *Vireo leucophrys* of southern Middle and South America is regarded as a species separate from the northern *V. gilvus; Basileuterus fulvicauda* is regarded as distinct from *B. rivularis*; and *Diglossa humeralis* is regarded as distinct from *D. carbonaria*.

Pyrrhura albipectus (2): ♂ 110; ♀ 98
Threnetes leucurus (1): unsexed 6, 6.5
Phaethornis guy (1): unsexed 5, 5.5, 5.5
Phaethornis syrmatophorus (4): ♂ 5.5; unsexed 6
Phaethornis griseogularis (1): unsexed 2.5
Eutoxeres aquila (1): unsexed 9.5, 11
Colibri thalassinus (6, 10): 6 unsexed 4.6 ± 0.9 (4–5.5)
Amazilia amazilia (3): unsexed 4
Adelomyia melanogenys (4, 6, 10): ♂ 4.5; 9 unsexed 3.9 ± 0.2 (3.5–4)
Heliodoxa rubinoides (4): ♀ 7.5
Lafresnaya lafresnayi (7, 9, 11, 13, 14): ♂ 5; 8 ♀♀ 4.7 ± 0.5 (4–5.5); unsexed 5.5, 6.5
Coeligena coeligena (4): unsexed 8
Coeligena torquata (7, 14): ♂♂ 8.5, 9; ♀ 7.5
Coeligena lutetiae (13, 14): 6 ♂♂ 7.7 ± 0.8 (7–9); ♀ 7.5
Coeligena iris (6, 10, 11, 13): 7 ♂♂ 6.8 ± 0.6 (6–7.5); ♀ 6.5; 17 unsexed 6.8 ± 0.5 (6–8)
Heliangelus amethysticollis (4): ♂♂ 5, 5.5
Heliangelus exortis (7, 13, 14): 9 ♂♂ 4.6 ± 0.7 (3–5); ♀♀ 5, 5; unsexed 4.5, 5, 5, 5.5
Heliangelus viola (6, 9, 10, 11): ♂♂ 5, 6.5; J 5.5; unsexed 5, 5.5, 5.5
Eriocnemis vestitus (11, 13): ♀ 5; unsexed 5.5
Lesbia nuna (5, 6, 9, 10): ♀♀ 3, 3.5, 4, 4
Metallura tyrianthina (9, 11, 13, 14): 7 ♂♂ 3.8 ± 0.4 (3.5–4.5); 8 ♀♀ 3.6 ± 0.4 (3–4); unsexed 4, 4
Chalcostigma herrani (14): ♀ 5
Aglaiocercus kingi (4): ♀ 4
Trogon personatus (12): ♀ 57
Galbula pastazae (1): ♂ 32.5; ♀ 31
Aulacorhynchus derbianus (2): unsexed 200
Veniliornis fumigatus (10): unsexed 42.5
Dendrocincla tyrannina (7): ♂ 56
Sittasomus griseicapillus (1): unsexed 18
Glyphorynchus spirurus (1): unsexed 13
Xiphorhynchus triangularis (4): unsexed 46.5
Lepidocolaptes affinis (11): unsexed 33
Synallaxis azarae (5, 9, 13, 14): JJ 15, 15.5; 7 unsexed 15.4 ± 1.0 (14–17)
Synallaxis unirufa (7, 14): unsexed 18, 21.5
Synallaxis gularis (13, 14): JJ 11, 12, 12.5; 11 unsexed 12.8 ± 0.7 (12–14)
Cranioleuca antisiensis (5, 6, 8, 10): 12 unsexed 15.4 ± 1.8 (13–18)
Margarornis squamiger (11, 13, 14): 6 unsexed 17.7 ± 0.9 (16–18.5)
Premnoplex brunnescens (4): ♂ 15; 11 unsexed 16.4 ± 1.1 (14.5–18)
Pseudocolaptes boissonneautii (11, 13, 14): 5 unsexed 49.6 ± 2.3 (46.5–52)
Thripadectes melanorhynchus (1): unsexed 38, 46
Thamnophilus zarumae (5): ♂ 23.5
Thamnistes anabatinus (1): unsexed 19.5
Dysithamnus mentalis (1): ♀ 15
Myrmotherula spodionota (1): ♂ 10
Cercomacra nigrescens (2): ♂ 16, 18.5; ♀ 17; J 15.5
Pyriglena leuconota (1, 4): ♂♂ 31, 33.5
Hylophylax poecilonota (1): ♂ 18
Grallaria rufula (14): unsexed 39
Grallaricula nana (7:) ♂ 21
Grallaricula peruviana (4): ♀ 18
Conopophaga castaneiceps (1): ♀ 25.5
Myornis senilis (13, 14): unsexed 19.5, 21.5, 23
Scytalopus femoralis (4): ♂ 25
Scytalopus latebricola (9): unsexed 18
Ampelion rubrocristatus (10): unsexed 59
Pipreola riefferii (4, 7): ♂♂ 49.5, 53; ♀♀ 43, 48.5
Pipreola arcuata (7): ♂ 119
Pachyramphus versicolor (2, 4): ♂♂ 13.5, 15
Pipra isidorei (1): ♂ 7; ♀♀ 8.5, 9
Masius chrysopterus (2, 4): ♂♂ 10.5, 10.5; ♀ 13
Myiotheretes fumigatus (14): unsexed 32

Ochthoeca fumicolor (13, 14): 5 unsexed 17.1 ± 0.7 (16–18)
Ochthoeca rufipectoralis (7, 14): 6 unsexed 11 ± 0.8 (9.5–11.5)
Ochthoeca cinnamomeiventris (4): unsexed 11, 13
Ochthoeca frontalis (14): unsexed 10.5, 11
Ochthoeca jelskii (10): unsexed 9.5, 10, 11
Ochthoeca diadema (7, 13, 14): 5 unsexed 10.7 ± 1.4 (9.5–13)
Sayornis nigricans (2): unsexed 20
Myiodynastes chrysocephalus (2): JJ 42, 42.5
Myiarchus tuberculifer (7): unsexed 20.5
Myiotriccus ornatus (1): unsexed 12.5, 12.5, 12.5
Pyrrhomyias cinnamomea (7, 11, 13): unsexed 9, 10, 10
Myiophobus phoenicomitra (1, 4): ♂♂ 12.5, 12.5; ♀ 11.5
Myiophobus cryptoxanthus (2): ♀ 8.5
Myiophobus lintoni (7): J 10
Hirundinea ferruginea (2): unsexed 31, 32, 40
Platyrinchus mystaceus (1): unsexed 7.5, 12
Tolmomyias assimilis (1): unsexed 16
Idioptilon granadense (13): unsexed 8, 8
Pseudotriccus pelzelni (4): ♂ 11; unsexed 11
Pseudotriccus rificeps (14): unsexed 11
Anairetes parulus (13): unsexed 6, 6, 6.5
Serpophaga cinerea (4): unsexed 8
Mecocerculus poecilocercus (6, 10): unsexed 7, 7.5, 7.5
Mecocerculus calopterus (3): unsexed 7, 7
Mecocerculus stictopterus (10, 11, 14): unsexed 9, 9, 10.5
Elaenia pallatangae (9, 10): 5 unsexed 15.1 ± 1.5 (13.5–17.5)
Tyranniscus uropygialis (8): unsexed 7
Leptopogon superciliaris (1, 2): ♂ 13.5; unsexed 11.5, 13.5
Leptopogon rufipectus (4): unsexed 12.5, 15
Mionectes striaticollis (1, 4): unsexed 13, 15, 15.5
Mionectes olivaceus (1): 5 unsexed 13.6 ± 1.4 (12.5–15.5)
Notiochelidon flavipes (7): ♀ 9
Cinnycerthia unirufa (7, 13, 14): ♂ 30; J 24.5; 12 unsexed 28.2 ± 2.6 (25–32.5)
Cinnycerthia peruana (4): 7 unsexed 25.7 ± 2.2 (22–28)
Cistothorus platensis (13): unsexed 12.5
Thyrothorus euophrys (7, 14): ♀ 31; unsexed 31.5
Troglodytes solstitialis (11, 14): 5 unsexed 10.7 ± 1.1 (9–12)
Henicorhina leucosticta (1): unsexed 15
Henicorhina leucophrys (1, 4, 10): 9 unsexed 14.9 ± 0.8 (13.5–16)
Myadestes ralloides (1, 4): unsexed 27, 28, 28.5, 30
Catharus fuscater (4, 10): 5 unsexed 34.6 ± 1.1 (33.5–36)
Catharus ustulatus (1, 2): 8 unsexed 28.4 ± 2.3 (25.5–33)
Turdus fulviventris (4): ♂♂ 70, 71; ♀ 69
Vireo leucophrys (6): unsexed 12.5, 13
Hylophilus olivaceus (1): unsexed 12, 12, 13
Cacicus holosericeus (14): unsexed 64
Parula pitiayumi (1): unsexed 7.5, 8
Dendroica fusca (2, 9): ♂ 10; ♀ 8.5
Wilsonia canadensis (1): unsexed 9.5
Myioborus miniatus (1, 4, 5, 6): 6 unsexed 9.8 ± 0.9 (9–11.5)
Myioborus melanocephalus (7, 13, 14): JJ 12.5, 13.5; 5 unsexed 12.0 ± 1.2 (11–14)
Basileuterus nigrocristatus (6, 7, 9, 10, 12, 13, 14): 15 unsexed 11.9 ± 1.3 (9.5–14)
Basileuterus luteoviridis (13, 14): 5 unsexed 16.1 ± 2.4 (13–19.5)
Basileuterus tristriatus (4): 6 unsexed 12.9 ± 1.2 (11–14.5)
Basileuterus trifasciatus (3, 6, 10): 9 unsexed 9.7 ± 0.8 (8.5–11); J 9
Basileuterus coronatus (4, 7, 11, 13, 14): 11 unsexed 15.5 ± 2.5 (12–20.5)
Basileuterus fraseri (3): unsexed 14
Basileuterus fulvicauda (1): unsexed 13, 13.5, 16
Coereba flaveola (1): unsexed 10, 10
Conirostrum sitticolor (13): unsexed 12, 12.5
Diglossa lafresnayii (13, 14): 6 unsexed 15.7 ± 1.5 (14–18.5)
Diglossa humeralis (9, 13): ♂ 13; J 11; unsexed 14

Diglossa albilatera (5, 6, 7, 9, 10, 13, 14): 11 ♂♂ 10.3±1.1 (9.5–12.5); 5 ♀♀ 9.3±0.4 (8.5–9.5); JJ 10.5, 11; unsexed 10, 10.5
Diglossa glauca (4): ♀ 11; unsexed 10.5, 12
Diglossa cyanea (4, 7, 11, 13, 14): 18 unsexed 18.1±1.7 (16–23.5)
Iridophanes pulcherrima (2): ♂ 17
Euphonia xanthogaster (1, 2, 6, 10): ♂♂ 13, 13.5, 13.5, 15; 6 ♀♀ 14.1±0.4 (13.5–14.5)
Chlorochrysa calliparaea (2, 4): ♂ 17.5; ♀ 19
Tangara chilensis (1): unsexed 22
Tangara punctata (1, 2): ♂ 17; unsexed 16, 18
Tangara parzudakii (2): ♀ 35
Tangara cyanotis (2): ♀ 17
Tangara cyanicollis (1, 2): ♂ 18; unsexed 16.5
Tangara ruficervix (2): ♂ 18.5
Tangara nigroviridis (4): ♂ 18
Tangara vassorii (8, 9, 13, 14): ♂ 17; ♀ 20; J 13; 6 unsexed 17.8±1.1 (16.5–19.5)
Iridosornis analis (4): ♂ 24; unsexed 28
Iridosornis rufivertex (7, 13): 5 unsexed 23.0±1.7 (21–25)
Anisognathus igniventris (7, 13): J 33.5; 5 unsexed 35.4±3.1 (31.5–40)
Anisognathus lacrymosus (7, 9, 13, 14): 18 unsexed 33.7±2.5 (30–38)
Dubusia taeniata (13): unsexed 38, 39
Ramphocelus carbo (2): ♂ 30; J 27.5
Calochaetes coccineus (2): ♀ 48
Piranga leucoptera (2): ♂ 21
Piranga rubriceps (7): ♂ 42
Tachyphonus rufus (2): ♀ 36.5
Thylpopsis ornata (5, 7): unsexed 11.5, 12
Chlorospingus ophthalmicus (4): ♀ 18; JJ 17.5, 20.5; 7 unsexed 22.1±2.2 (19–25)
Chlorospingus flavigularis (1): 10 unsexed 26.4±1.8 (23.5–28.5)
Chlorospingus parvirostris (1, 2, 4): ♂ 23; ♀ 20; unsexed 22, 25.5
Chlorospingus canigularis (4): ♂ 17; unsexed 16.5
Cnemoscopus rubrirostris (7, 13): unsexed 22.5, 24, 24.5
Hemispingus atropileus (7, 13, 14): 8 unsexed 23.6±2.6 (17.5–26)
Hemispingus verticalis (14): unsexed 14.5, 15
Catamblyrhynchus diadema (6, 10, 13, 14): J 15; 6 unsexed 19.3±2.9 (15–23.5)
Saltator maximus (1): unsexed 42.5
Pitylus grossus (1): ♂ 43.5; ♀ 37
Oryzoborus angolensis (1): ♂ 14; 5 ♀♀ 13.2±1.0 (12–14.5)
Catamenia homochroa (9): ♂ 12.5
Atlapetes pallidinucha (9, 14): 7 unsexed 34.2±6.0 (29–46.5)
Atlapetes rufinucha (5, 6, 7, 9, 10, 12, 13): JJ 25.5, 30; 17 unsexed 29.5±3.8 (23–37)
Atlapetes leucopterus (3): unsexed 24, 24, 25.5
Atlapetes brunneinucha (2): ♀ 46
Atlapetes torquatus (5, 9, 10, 13): 6 unsexed 42.1±5.9 (33–50)
Arremon aurantiirostris (1): unsexed 26.5, 28
Myospiza aurifrons (1, 4): unsexed 18, 19
Zonotrichia capensis (2, 5, 9, 11): J 22.5; unsexed 20.5, 21.5, 24, 26.5
Spinus magellanicus (2): ♂♂ 11, 11

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Distributional records, natural history notes, and conservation of some poorly known birds from southwestern Ecuador and northwestern Peru

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The Andean foothills and adjacent coastal plain of southwestern Ecuador and northwestern Peru form an ecological transition zone between the very humid Colombian and Ecuadorean Pacific rainforests to the north, and the xeric coastal area of Peru to the south. This topographically complex area supports a very broad spectrum of habitats, ranging from dry, desert-like scrub to very humid cloud forests. This range of vegetation types is influenced by a strongly seasonal climate: the period from May to November is usually very dry, but a pronounced wet season occurs from December to April in most years (Brown 1941, Munday & Munday 1992).

Early bird collectors achieved relatively complete geographic coverage and a thorough synthesis of the avifauna was possible by the late 1920s (Chapman 1926). Chapman named the characteristic bird species of the region the *Equatorial Arid Fauna*. In contrast to early ornithological effort, there were very few surveys between 1930 and 1970 (e.g. Marchant 1958, Koepcke 1961, D. Norton and R. A. Paynter in 1964–1965); only in the late 1970s and 1980s did zoologists begin to reinvestigate the area (Schulenberg & Parker 1981, Parker *et al.* 1985, Wiedenfeld *et al.* 1985, Parker *et al.* 1989, Robbins & Ridgely 1990). Up to 1990 the region was still poorly represented in the ornithological literature, and one of its endemic species (the El Oro Parakeet *Pyrrhura orcesi*) was only formally described in 1988 (Ridgely & Robbins 1988). In the last five years, however, survey work has intensified and several survey reports have